

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A balanced-unbalanced multiband filter module comprising a high-frequency antenna switch for switching the connection of an antenna to a transmitting circuit and the connection of said antenna and a receiving circuit and usable in a multiband mobile phone for the pluralities of communications systems using close frequency bands, said balanced-unbalanced multiband filter module comprising three high-frequency switches each comprising a switching element, and two balanced-unbalanced bandpass filters having different transmitting frequency bands,

a first high-frequency switch comprising a first port connected to an unbalanced port of said module, a second port connected to an unbalanced port of the first balanced-unbalanced bandpass filter, and a third port connected to an unbalanced port of a second balanced-unbalanced bandpass filter;

a second high-frequency switch comprising a first port connected to the first balanced port of said module, a second port connected to the first balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to the first balanced port of the second balanced-unbalanced bandpass filter; and

a third high-frequency switch comprising a first port connected to the second balanced port of said module, a second port connected to the second balanced port of the first balanced-

unbalanced bandpass filter, and a third port connected to the second balanced port of the second balanced-unbalanced bandpass filter; and

being disposed on a transmitting side and/or a receiving side of said high-frequency circuit,

on said transmitting side, an unbalanced port of said balanced-unbalanced multiband filter module being connected to a high-frequency amplifier connected to a transmitting port of said high-frequency antenna switch,

on said receiving side, an unbalanced port of said balanced-unbalanced multiband filter module being connected to a receiving port of said high-frequency antenna switch, and

said first and second balanced ports of said module being connected to the balanced ports of said filter module connected to a low-noise amplifier,

 said first to third high-frequency switches being switched depending on a passing high-frequency signal, whereby a high-frequency signal of the first or second communication system input into an unbalanced port of said module is output to said low-noise amplifier from the first and second balanced ports, and a high-frequency signal of the first or second communication system input into said first and second balanced ports is output to said high-frequency amplifier from an unbalanced port of said module.

2. (currently amended): A balanced-unbalanced multiband filter module comprising a high-frequency antenna switch for switching the connection of an antenna to a transmitting circuit and the connection of said antenna and a receiving circuit and usable in a multiband mobile phone for the pluralities of communications systems using close frequency bands, said

balanced-unbalanced multiband filter module comprising two balanced-unbalanced bandpass filters having different transmitting frequency bands, and six phase shifters connected to said balanced-unbalanced bandpass filter,

 a first phase shifter comprising a first port connected to an unbalanced port of said module, and a second port connected to an unbalanced port of the first balanced-unbalanced bandpass filter;

 a second phase shifter comprising a first port connected to an unbalanced port of said module, and a second port connected to an unbalanced port of the second balanced-unbalanced bandpass filter;

 a third phase shifter comprising a first port connected to the first balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to the first balanced port of said module;

 a fourth phase shifter comprising a first port connected to the second balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to the second balanced port of said module;

 a fifth phase shifter comprising a first port connected to the first balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the first balanced port of said module; and

 a sixth phase shifter comprising a first port connected to the second balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the second balanced port of said module;

whereby a high-frequency signal of the first or second communication system input into an unbalanced port of said module is output to said low-noise amplifier from said first and second balanced ports, or a high-frequency signal input of the first or second communication system into said first and second balanced ports is output to said high-frequency amplifier from an unbalanced port of said module.

3. (currently amended): A balanced-unbalanced multiband filter module comprising a high-frequency antenna switch for switching the connection of an antenna to a transmitting circuit and the connection of said antenna and a receiving circuit and usable in a multiband mobile phone for the pluralities of communications systems using close frequency bands, said balanced-unbalanced multiband filter module comprising a high-frequency switch comprising switching element, two balanced-unbalanced bandpass filters having different transmitting frequency bands, and four phase shifters connected to said balanced-unbalanced bandpass filters, said high-frequency switch comprising a first port connected to an unbalanced port of said module, a second port connected to an unbalanced port of the first balanced-unbalanced bandpass filter, and a third port connected to an unbalanced port of the second balanced-unbalanced bandpass filter;

a first phase shifter comprising a first port connected to the first balanced port of the first balanced-unbalanced bandpass filter, and the second port connected to the first balanced port of said module;

a second phase shifter comprising a first port connected to the second balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to the second balanced port of said module;

a third phase shifter comprising a first port connected to the first balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the first balanced port of said module; and

a fourth phase shifter comprising a first port connected to the second balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the second balanced port of said module;

said first high-frequency switch being switched depending on a passing high-frequency signal, whereby a high-frequency signal input of the first or second communication system into an unbalanced port of said module is output to said low-noise amplifier from the first and second balanced ports, or a high-frequency signal of the first or second communication system input into said first and second balanced ports is output to said high-frequency amplifier from an unbalanced port of said module.

4. (currently amended): A balanced-unbalanced multiband filter module comprising a high-frequency antenna switch for switching the connection of an antenna to a transmitting circuit and the connection of said antenna and a receiving circuit and usable in a multiband mobile phone for the pluralities of communications systems using close frequency bands, said balanced-unbalanced multiband filter module comprising two high-frequency switches each comprising a switching element, two balanced-unbalanced bandpass filters having different

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transmitting frequency bands, and two phase shifters connected to said balanced-unbalanced bandpass filter,

 a first phase shifter comprising a first port connected to an unbalanced port of said module, and a second port connected to an unbalanced port of the first balanced-unbalanced bandpass filter;

 a second phase shifter comprising a first port connected to an unbalanced port of said module, and a second port connected to an unbalanced port of the second balanced-unbalanced bandpass filter;

 a first high-frequency switch comprising a first port connected to the first balanced port of said module, a second port connected to the first balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to the first balanced port of the second balanced-unbalanced bandpass filter;

 a second high-frequency switch comprising a first port connected to the second balanced port of said module, a second port connected to the second balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to the second balanced port of the second balanced-unbalanced bandpass filter;

 said first and second high-frequency switches being switched depending on a passing high-frequency signal, whereby a high-frequency signal input of the first or second communication system into an unbalanced port of said module is output to said low-noise amplifier from the first and second balanced ports, or a high-frequency signal of the first or

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second communication system input into said first and second balanced ports is output to said high-frequency amplifier from an unbalanced port of said module.

5. (currently amended): The balanced-unbalanced multiband filter module according to claim 1, any one of claims 1-4, wherein said first and second balanced-unbalanced bandpass filters have different input impedance Z_i and output impedance Z_o , thereby exhibiting an impedance conversion function.

6. (currently amended): The balanced-unbalanced multiband filter module according to claim 1, any one of claims 1-4, wherein said balanced-unbalanced bandpass filter is a SAW filter or an FBAR filter.

7. (currently amended): The balanced-unbalanced multiband filter module according to claim 1, any one of claims 1 and 3, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, ~~transmission lines constituting said phase shifters and said high frequency switches being formed by said electrode patterns, and switching elements constituting said high frequency~~

~~switches and not only said balanced-unbalanced bandpass filters being mounted onto a main surface of said laminate of pluralities of dielectric layers but also switching elements being mounted onto said main surface of said laminate, and terminal electrodes for the first and second ports being formed on one side of a bottom surface of said laminate of pluralities of dielectric layers and a terminal electrode for the unbalanced port being formed on an opposite side of said bottom surface thereof.~~

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8. (previously presented): A multiband mobile phone comprising a high-frequency circuit having the balanced-unbalanced multiband filter module recited in claim 1.

9. (new): The balanced-unbalanced multiband filter module according to any one of claims 2 and 4, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, not only said balanced-unbalanced bandpass filters being mounted onto a main surface of said laminate of pluralities of dielectric layers but also transmission lines constituting said phase shifters being formed by said electrode patterns, and terminal electrodes for the first and second ports being formed on one side of a bottom surface of said laminate of pluralities of dielectric layers, and a terminal electrode for the unbalanced port being formed on an opposite side of said bottom surface thereof.

10. (new): The balanced-unbalanced multiband filter module according to claim 5, wherein said balanced-unbalanced bandpass filter is a SAW filter or an FBAR filter.

11. (new): The balanced-unbalanced multiband filter module according to claim 5, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, not only said balanced-unbalanced bandpass filters being mounted onto a main surface of said laminate of pluralities of dielectric layers but also switching elements being mounted onto said main surface of said laminate, and terminal electrodes for the first and second ports being formed on one side of a bottom surface of said laminate of pluralities of dielectric layers and a terminal electrode for the unbalanced port being formed on an opposite side of said bottom surface thereof.

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12. (new): The balanced-unbalanced multiband filter module according to claim 6, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, not only said balanced-unbalanced bandpass filters being mounted onto a main surface of said laminate of pluralities of dielectric layers but also switching elements being mounted onto said main surface of said laminate, and terminal electrodes for the first and second ports being formed on one side of a bottom surface of said laminate of pluralities of dielectric layers and a terminal electrode for the unbalanced port being formed on an opposite side of said bottom surface thereof.

13. (new): The balanced-unbalanced multiband filter module according to claim 5, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, not only said balanced-unbalanced bandpass filters being mounted onto a main surface of said laminate of pluralities of dielectric layers but also transmission lines constituting said phase shifters being formed by said electrode patterns, and terminal electrodes for the first and second ports being formed on one side of a bottom surface of said laminate of pluralities of dielectric layers, and a terminal electrode for the unbalanced port being formed on an opposite side of said bottom surface thereof.

14. (new): The balanced-unbalanced multiband filter module according to claim 6, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, not only said balanced-unbalanced bandpass filters being mounted onto a main surface of said laminate of pluralities of dielectric layers but also transmission lines constituting said phase shifters being formed by said electrode patterns, and terminal electrodes for the first and second

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ports being formed on one side of a bottom surface of said laminate of pluralities of dielectric layers, and a terminal electrode for the unbalanced port being formed on an opposite side of said bottom surface thereof.